

MAR/87

ZX-Appeal

Vancouver Sinclair Users Group

next meeting:

KILLARNY COMMUNITY CENTRE
6260 KILLARNY STREET
VANCOUVER

FRIDAY; 7:00PM

MAR 13/87

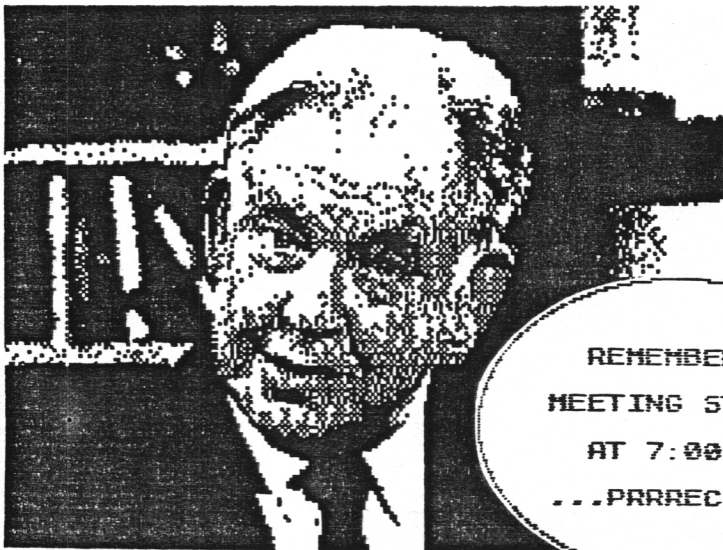


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ZXAppeal is a monthly newsletter put out by the Vancouver Sinclair Users Group. For more information on the group and ZXAppeal see the backcover.

Feature Report

Data-Skip VIDEOfACE



ALSO:

*ZX Voice Hardware
Project*

REMEMBER...
MEETING STARTS
AT 7:00 PM
...PRRRRECISELY

THIS ISSUE.....

Another month zipps by and another Issue of ZXAppeal. And a pretty good Issue, if I don't say so myself. The major report this month is from Dan P. regarding his recently aquired Video Digitalizer for the 2068 in Spectrum mode. His report is within. Gerd B. supplies the constuction details for the ZX Voice board from the Hardware SIG. Some boards are still available and more can be made so step right up. Harvey T. submits his latest in his ongoing series on things QL. Rusty T. gives us his 'Member Profile'. Ken A. supplies a simple modem hardware upgrade. Vince L. offers 'More value for your Bytes'. Joe J. of the Lone Star State sends in a neat little program to display the drawing abilities of the 2068. Tim S. gives us a simple hardware fix to get that perfect picture on the 1000. And other stuff I think you'll interesting and informative.

BITS & PIECES.....

...another periodical is leaving the ZX/TS scene. TS Horizons has advised all subscribers that only nine more issues will be published. Rick says many things contributed to his decision but the main obstacle was TIME. He says he might reconsider if he is able to find people willing to share the various tasks that go into such a publication.

...the QL draw is well underway but some members have yet to get their tickets. You out-of-towners can get in the draw - just send in your \$ and your in. Your ticket stubb will be sent back to you. We can't make the draw until all 100 tickets are gone. The kit will be shown at the meeting.

...ZX Voice boards are available at the meeting. It's been a while since we had a hardware project originate with the group.

...128K NVM for the 2068 is now available. Rumours mention 256K of

NVM Ramdisk is just around the corner.

...reports of their demise were slightly exaggerated! ZEBRA SYSTEM is still with us and I am assured they will be for sometime. Their BBS is also back up.

...the POWER 3000 lives! Some of you will remember the article on this 1000 clone that mentioned sound and colour but when availability was looked into -- poof -- smoke and mirrors. Well look at the ad in the April Radio-Electronics for American Design Components near the back.

...You'll recall the offer conveyed to the group last meeting from Tim S. re: upgraded rampaks. Tim says he'll upgrade any members 1000 to 64K INSIDE for just the cost of parts. More details at the meeting. ...remember to inventory your set-ups and bring your equipment profile to the meeting. This'll help form a equipment database for future reference.

...any of you wishing to test the TIMEX Service Department turnaround time, the address is TIMEX SERVICE DEPT., P.O. Box 2740, Little Rock, Arkansas 72203. The fee for repairs to a 2068 is \$29.95US. I'm not sure re:1500s or 1000s

RENEWING MEMBERS:

Eric Sakara, Marcio Vieira
Marie Kendall, Dan Pinko
Ian McLean, Doug Jeffery

NEW MEMBERS:

George Patterson, Queen Charlotte
City, B.C.
John Sumpolec, Jr., Las Vegas, NV.

Remember to renew at the meeting if you received the dreaded EXPIRY NOTICE.

NEVER-SAY-DIE SINCLAIR IS BACK IN THE COMPUTER BUSINESS

The UK's computer guru, Sir Clive Sinclair, has risen from the ashes to launch a new computer—almost a year to the day after he quit the computer business. He announced this week at the Which Computer? Show in Birmingham, UK, the formation of a new company, Cambridge Computer Ltd., and introduced the first in a family of personal computers, a laptop costing \$300 that will be available in April. Sinclair sold Sinclair Research Ltd.'s computer business to Amstrad last year and said he was going to concentrate on other technologies, such as wafer-scale integration and electric vehicles [*Electronics*, April 14, 1986, p. 64]. Sinclair also sold Amstrad full rights to the name Sinclair to use with computers. □

Electronics/February 19, 1987

THE GLOBE AND MAIL

THURSDAY, FEBRUARY 19, 1987

Sir Clive tries again

Sir Clive Sinclair, the British inventor who was forced to sell his computer empire after it fell on hard times last year, has unveiled what he contends is the world's smallest and most portable personal computer.

Described as the "first portable with full personal computer facilities," the new Z88 weighs less than two pounds, measures 11½ by 8¼ inches and has a memory capable of storing the entire works of Shakespeare.

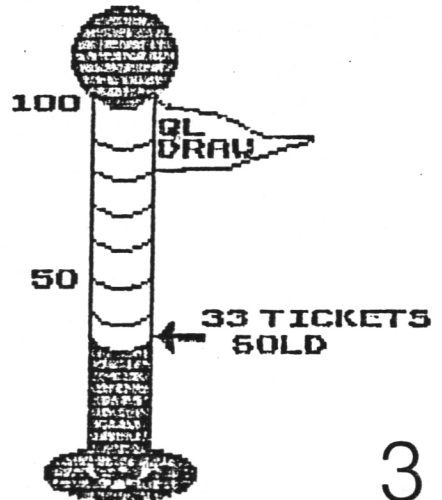
Sir Clive, whose disastrous venture into electric cars with his miniature C5 tricycle failed to catch the public's imagination, sold his previous computer company and even the "Sinclair" name to rival computer maker Amstrad Consumer Electronics PLC last year for \$10.2-million.

But the deal did not prevent him from producing other models. The Z88 is the first design from his new company, Cambridge Computer, although it cannot bear his name.

The first models will be produced by Thorn-EMI Datatech. Talks are taking place with other manufacturers to expand production.

MEETING DATE....

MARCH						
SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				



The meeting was opened by Ken, the prez, at 19:22. The first topic raised was the Help Clinic. It seems that so far only one problem has arisen; a fellow out of town had a problem with a 2068 joystick. Note was made of the fact that in general no Equipment Lists were forthcoming. Lets try for next month gang!

The hardware group reported that the ZXVOICE project is coming along well. The only work remaining is the documentation and the edge connectors. These boards work with both the ZX81 & the 2068. Rod Humphries has 10 of the boards available to club members at \$10.00 each. With all chips the project will cost about \$25.00. The next project in the works is a Keyboard Beeper/Eprom Burner for the ZX81 & possibly the 2068 as well. Final design specifications have not been drawn up, so take that as very changeable.

Rod, the Treasurer/Editor, reported that as of meeting time we have \$241.17 in the credit union as well as one unreceived QL kit & the 10 ZXVOICE boards. Rod then fantasized about driving nonstop to the Indiana ComputerFest in a whirl of bits, bytes & nonprescription enthusiasm. Rod then showed his Sinclair Flat Screen TV which he got at the same time as his QL kit. All were generally impressed with the quality of the picture.

Rod then mentioned that Tim Stoddard from New York State (!) wished to join our little group & further that he was making a 16K->64K conversion deal available to club members at cost. Contact Rod if interested. Tim's next project will be 64K on the ZX81 with three chips, no doubt using the new 62256-32K statics.

The next Robotics Club meeting is 18:30, MAR 18 at 470 Granville; that's Al Wright's office.

Ian, the ZX81 Librarian, stood to ask for more programs for the club. He made available a list of programs in the library. Ian raised the possibility of a Programming Special Interest Group similar to the Hardware Group. Several people expressed interest in this. Ian is to be the Contact person.

Rusty Townsend donated a whole bunch of ZX81 software to the library. We were faced with the interesting spectacle of a hardware auction, with all proceeds going to the club. Long live Flea markets! By the way, Rusty will be doing a member profile this month.

Guido Vereira stood to announce that he is setting up a BBS on his 2068. I think we should all support Guido in this undertaking. At present he is waiting for a modem repair, but we will publish the number when we get it.

There was some discussion of problems members might have getting their new QL hooked up to monitor. Harvey made himself generally available for questions of this sort. Harvey mentioned the Transputer board being developed in the UK as a QL add-on.

Ken then stood to introduce Rois Harder, one of the original founders, just recently back from 2 years in Yanbu, Saudi Arabia with the telephone company. Rois mentioned that the very first meeting (3 people) away back in the dark ages of 1982 was quite short because the basement flooded. We were then told tales of translation woes (trying to buy 2 shovels from a Bedouin who didn't speak a word of English), different management styles (being 'glued to the job' by absolute responsibility), and benzene being cheaper than water (12 cents a liter versus 15). Rois told us that to save his sanity he took up QL, computing and bird photography. He brought several albums of photos for us to look through. Rois says he returned to Canada with a much greater appreciation of the freedoms we take for granted.

The meeting dissolved to general mayhem & merriment.

PLAYING WITH ELECTRICITY

-Harvey Taylor

At the bottom of the 68000's address space there is provision for a 1K table of vectors to use in exception processing. An exception is what the Motorola engineers call an interrupt, but the term is also used to apply other conditions, such as Bus errors, software errors such as Divide by zero. See the program below for the complete list. In fact, the whole table is rarely completely filled in and this is the case on the QL.

The 68000 has 7 interrupt priorities [1-7], but the 68008 has only 3 levels [2,5 & 7]. Of these the QL uses Level 2; Level 5 is ignored and Level 7 is present but requires special software.

Coincidentally, there are several things that Sinclair does not mention in the QL User Guide. DO NOT DO THIS WITH A MICRODRIVE INSERTED. Touching the keys <ALT><CTRL><7> causes the 8749 coprocessor to generate a Level 7 Interrupt in the 68008. QDOS does not trap this eventuality however & the QL heads for NeverNeverLand unless the above mentioned special software is present. [Briefly, each job can redirect a subset of 19 Exception Vectors, among them Level 7, and you have to write a Level 7 exception handler.]

One of the other useful things not mentioned in the User Guide is the fact that <CTRL><F5> freezes the screen display. You will find this useful in long directories.

Because the 1K map of exceptions is well defined one can easily write a program which will read this table. The only tricky part is that there are some undocumented vectors in the table. Similarly, one can follow what the QL does on being interrupted. This code follows, and then the basic program for printing out the Exception table is listed.

```
*
* This is what turns up as CODE in the Basic program.
*
000020 6126      BSR      L#00000050 * Address Error
00002A 6124      BSR      L#00000050 * Illegal Instruction
00002C 6122      BSR      L#00000050 * Zero Divide
00002E 6120      BSR      L#00000050 * CHK Instruction      * These addresses all go to
000030 611E      BSR      L#00000050 * TRAPV Instruction      * $50...The subroutine there
000032 611C      BSR      L#00000050 * Privilege Violation * checks where its coming from
000034 611A      BSR      L#00000050 * TRACE mode          * by examining the stacked
000036 6118      BSR      L#00000050 * INT. LEVEL 7      * return address.
000038 6116      BSR      L#00000050 * TRAP#5
00003A 6114      BSR      L#00000050 * TRAP#6          * Note that Motorola defines
00003C 6112      BSR      L#00000050      ;          * the table as being LWORD entries;
00003E 6110      BSR      L#00000050      ;          * whereas QDOS uses WORD entries.
000040 610E      BSR      L#00000050      ;          * This is because other LWORD vectors
000042 610C      BSR      L#00000050      ;          * point to these WORD entries,
000044 610A      BSR      L#00000050      ;          * which are the Redirectable Vectors.
000046 6108      BSR      L#00000050      ;
000048 6106      BSR      L#00000050      ;
00004A 6104      BSR      L#00000050      ;
00004C 6102      BSR      L#00000050 * TRAP#15
00004E FFFF      DC.W          * Filler
```

```

000050 6000 00EA          BRA      L$0000013C          *
000054 049F 0000 002A    SUBI.L  #0000002A,(A7)+    * Subtract #2A from the stacked return address
00005A 6602          BNE      L$0000005E          * If non zero:
00005C 504F          ADDQ.W  #000,A7              * Adjust stack
00005E 4E73          RTE                  * Return from Exception
*
*
*
00013C 4AB9 0002 0050    TST.L   L$00020050          * Has a Redirected Vector Table been defined?
000142 6700 FF10    BEQ     L$00000054          * If no:
000146 2F0E          MOVE.L  A6,-(A7)            * Save current Sys_Var pointer
000148 3C6F 0006    MOVEA.W #0006(A7),A6       * Get Stacked Return Address
00014C DCCE          ADDA.W  A6,A6                * X2
00014E DDF9 0002 0050    ADDA.L  L$00020050,A6       * Add to base of Redirected Vector Table
000154 2F56 0004    MOVE.L  (A6),#0004(A7)     * Take address from table & put it above Sys_Var pointer on stack
000158 2C5F          MOVEA.L (A7)+,A6           * Retrieve the Sys_var pointer
00015A 4E75          RTS                  * "Return" to subroutine address defined in R V Table
*
*
*
* After the Processor reads #0354 in the Interrupt 2 slot of the
* exception table it jumps here & finds this code.
*
000354 40E7 0106    MOVEM.L D7/A5/A6,-(A7)    * save some registers
000358 2A4F          MOVEA.L A7,A5              *
00035A 2C7C 0002 0000    MOVEA.L #00020000,A6     * set A6=base of system variables
000360 1E39 0001 0021    MOVE.B  L$00010021,D7     * get Interrupt status from hardware
000366 E20F          LSR.B   #001,D7           * Test bit 0
000368 6500 279C    BCS     L$00002B06         * Go take care of microdrives
00036C E20F          LSR.B   #001,D7           * Test bit 1
00036E 6500 29A6    BCS     L$00002D16         * Go take care of interface
000372 E20F          LSR.B   #001,D7           * Test bit 2
000374 6500 29AC    BCS     L$00002D22         * Go take care of Serial ports
000378 E20F          LSR.B   #001,D7           * Test bit 3
00037A 6500 05A8    BCS     L$00000924         * Go take care of Video
00037E E20F          LSR.B   #001,D7           * Test bit 4
000380 6420          BCC     L$000003A2         * If not bit 4: exit ( Note BCC )
000382 40E7 FEFB    MOVEM.L D0-D6/A0-A4,-(A7) * Take care of external interrupt
000386 7000          MOVEQ   #000,D0            * Init for subroutine
000388 206E 0038    MOVEA.L #0038(A6),A0      * Get pointer to List of Int 2 Drivers from Sys_var
00038C 4EBA 0734    JSR     L$00000AC2         * Go through the list & find the right interrupt handler
000390 1E2E 0035    MOVE.B  #0035(A6),D7     * Get the current value of the Interrupt control Register
000394 0007 0010    ORI.B   #010,D7           * Set Bit 4
000398 13C7 0001 0021    MOVE.B  D7,L$00010021     * Tell the hardware
00039E 4CDF 1F7F    MOVEM.L (A7)+,D0-D6/A0-A4 *
0003A2 6000 0014    BRA     L$000003B8          *
0003A6 7000          MOVEQ   #000,D0            *
0003A8 0B2F 0005 000C    BTST    #005,#000C(A7)    * Test Bit 5 of SR register on stack
0003AE 6600          BNE     L$000003B8         * If Not Supervisor mode: exit
0003B0 4A6E 0030    TST.W   #0030(A6)         * Check count of poll interrupts missed
0003B4 6600 05A4    BNE     L$0000095A         * If non-zero:
0003B8 4CDF 6000    MOVEM.L (A7)+,D7/A5/A6    * Retrieve saved registers
0003BC 4E73          RTE                  * Return from Exception
*
*
*

```

Feature Report

HARDWARE REVIEW: Data-Skip VIDEOFACE

I recently received Data-Skip's VIDEOFACE Interface and Software and was so impressed with this product I wanted the rest of the TIMEX/SINCLAIR world to know of its existence so the following is a short review of this product.

The purpose of the VIDEOFACE is to take a video signal either from a TV or VCR equipped with a video out jack and transfer this signal into a digitized format that can be used by the SINCLAIR SPECTRUM (2068) Computer as a screen display. The hardware part of the package consists of a unit a little wider than the old ZX81 RAMPACK with a SPECTRUM through edge connector, a jack located on the left side (for VIDEO IN signal) a small variable control above the jack and approximately in the center of the unit, two LEDs - one red and one green. The unit is designed to plug into the back of the SPECTRUM computer with the through edge connector allowing you to connect the SINCLAIR printer or the 2040 printer. I have one of my TIMEX 2068 Computers connected to the SPECTRUM INTERFACE 1 and MICRODRIVE through one of the "TWISTER" boards that simulates the SPECTRUM bus. The INTERFACE 1 has the standard SPECTRUM bus available at the rear of the unit allowing me to plug the VIDEOFACE directly into the rear of the INTERFACE 1. The VIDEOFACE requires the standard 1 volt VIDEO signal that is found on all VCRs (the signal from my TOSHIBA VCR works just great). When the unit is powered up the green LED is lit anytime there is a video signal present at the input jack. The one variable control is referred to as the "SLICE" control. This determines the level of the video signal that the electronics either turns on that specific screen pixel or turns it off thus allowing you to control

the computer generated screen all the way from a totally white screen to an all black screen. The unit is I/O mapped and the red LED only comes on when the unit is been accessed.

The VIDEOFACE is manufactured in HOLLAND and I was concerned whether the unit would work with the NTCS TV system so before ordering the unit I wrote Data-Skip and asked if it would work with the NTCS TV system. They wrote back saying that it should work and my experience has proven this to be correct. European TV has a higher resolution than ours and the only problem that I have found (not really a problem) is that the screen wraps around if you use the cursor keys and scan the most right and bottom of the TV image. I was interested in the electronics inside the unit and also wanted to know if the unit could be plugged directly into the 2068. A preliminary inspection shows that the unit uses the following edge connections - D0 to D7, RD, IORQ, A7, A6, A1, A0, GND and +9v. All of these signals except the +9v are located on the same traces of the SPECTRUM and 2068 buses in reference to the SLOT location. The +9v trace on the SPECTRUM is not used on the 2068 and the VIDEOFACE uses the +9v and a 7805 voltage regulator to power the unit. The SPECTRUM was prone to overheating problems and I assume the designers of the VIDEOFACE decided to add their own +5v so as not to overload the SPECTRUM's 5v supply. The 2068 uses a switching powersupply and can handle a greater load on its +5v supply so a simple modification to the unit may make it 2068 compatible. I have NOT tried modifying the VIDEOFACE but plan to in the near future and will notify the newsletter as to the outcome.

The software that comes with the unit consists of a short BASIC and machine CODE program. The machine code is the work horse portion of the program controlling the

interface and displaying and storing the digitized video signal in memory. The BASIC handles the main introductory screen and all SCREEN\$ saving to Micro-drive, Cassette or Disk drives. It is easily MERGED and changed to handle any Disk drive system you may have - I had no problems converting the software to Micro-drive or to my OLIGER disk drives. The software works in SPECTRUM mode only and is VERY GOOD. The VIDEO image is scanned 3 times a second thus a slow moving or still picture is not required and my experience with the unit indicates that a usable image is almost always available from most TV programs. The software stores the last six digitized screens in memory constantly updating them. You can at any time stop the scanning and review the last 6 stored screens picking out the best one to save or send to the printer or just watch a simple 6 screen animation show. The speed at which the computer switches from one screen to the next can also be controlled over a wide range by using the 'F' and 'S' keys. Since the 2068 has a screen resolution of 256 * 192 pixels the whole TV screen can not be displayed at one time but by using the 4 cursor keys (5,6,7 and 8) you can shift the screen around locating the best view. The unit does not color the picture - the screen is black INK on white PAPER and the actual SCREEN\$ SAVE is a CODE SAVE of 6144 bytes leaving out the Attributes section. This code can be loaded into any ART type program and then modified and colored to the user's satisfaction. I have noticed that the VIDEOFACE prefers a color video signal and produces a screen picture with more shading than when feed a black and white picture (this produces a very high contrast picture but can produce some interesting effects.

The unit comes with a very short, poorly written manual being translated from Dutch into English and although helpful it is hard to understand in some places. The

software makes up for this and once you load the program within a few minutes you will be familiar with all the features. I recommend that the source of the video signal be a VCR because it allows you to rewind and view the picture over again adjusting the SLICE control until you have the exact picture you want. I originally used the direct signal from the TV but found that while adjusting the SLICE control I would miss the picture I wanted to save. By recording the program and then using the VCR this was no longer a problem. I did run into one very big problem though - I got so enthusiastic about saving screens that within the first hour I had filled a 60 minute cassette tape with SCREEN\$ dumps. After using it for a while you learn to be more selective with what you save.

Having used this product for the last few weeks I know that it was money well spent and I will be using it for a long time to come (not like some of the software I have purchased and looked at once). If you have any interest in screen displays either for business or just for fun I highly recommend this product the possibilities are endless. The price including AIRMAIL from Holland was \$93.00 (US funds) in December but this may have changed because of the constant changing dollar so please check with DATA-SKIP before ordering your VIDEOFACE. Their address is:

DATA-SKIP,
LANGE WILLEMSTEEG 12-14
2801 WC GOUDA,
HOLLAND.

ZX VOICE (C) 1986 W. RIGTER

FOR STARTERS, WOULD YOU PLEASE DIG OUT YOUR OCTOBER 1986 ISSUE OF ZX-APPEAL AND READ WILF RIGTER'S ARTICLE ON PG 9 ENTITLED "Z VOICE" ?

THANK YOU! NOW I ONLY HAVE TO TALK ABOUT HOW TO ASSEMBLE THE HARDWARE. THE SCHEMATIC HAS BEEN SLIGHTLY EXPANDED IN DETAIL OVER THE ONE PUBLISHED IN OCT '86, BUT IT IS ESSENTIALLY THE SAME. PLEASE REFER TO "NOTES FOR EXPERIMENTERS" ON THE SCHEMATIC FOR EXPLANATIONS OF DIFFERENCES.

PLEASE REFER TO THE "BILL OF MATERIAL" FOR YOUR SHOPPING / INVENTORY LIST. IF YOU ARE BUILDING THE BOARD FOR A TS1000 OR ZX 81 ONLY, CROSS C10, C11, R6, AND X1 OFF YOUR LIST. IF YOU ARE BUILDING FOR A 2068, CROSS OFF J2.

- THE 2068 VERSION WILL WORK ON TS/ZX 81
- KEN ABRAMSON IS ADAPTING THE SOFTWARE FOR THE 2068 AND IT MAY BE IN TIME FOR THIS ISSUE OF ZX-APPEAL OR THE NEXT ONE FOR SURE.
- YOU CAN NOT USE THIS BOARD ON A SPECTRUM (PIN 23 (RESET ON ZX 81) IS -12VDC ON SPECTRUM)

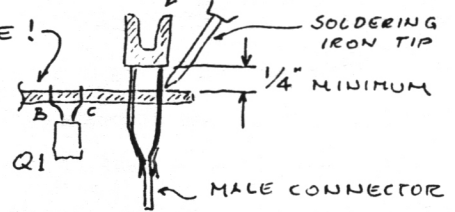
KEN ABRAMSON ALSO ADVISES THAT IN AREAS NEAR STRONG RADIO TRANSMITTERS, SPEAKER LEADS CAN ACT AS AN ANTENNA: YOU END UP LISTENING TO THE STATION AS WELL AS Z VOICE! THE FIX FOR THAT IS AN RF BY-PASS CAPACITOR .001 μ F ACROSS U2 INPUT PIN 3 TO GROUND.

I GUESS YOU HAVE ALL YOUR PARTS BY NOW, AND YOU ARE READY TO POPULATE THE BOARD. IF YOU USE AN EARPHONE JACK (OPTIONAL) YOU WILL HAVE TO ENLARGE THE EXISTING HOLE TO THE CORRECT SIZE TO FIT YOUR PARTICULAR JACK. YOU COULD ALSO SOLDER IN YOUR SPEAKER LEADS DIRECTLY INTO THE BOARD AND FORGET ABOUT AN EARPHONE JACK.

IF YOU ARE BUILDING THE 2068 VERSION, PLEASE READ THE "NOTES ON INSTALLATION OF R6" ON THE COMPONENT LAYOUT DRAWING BEFORE CONTINUING.

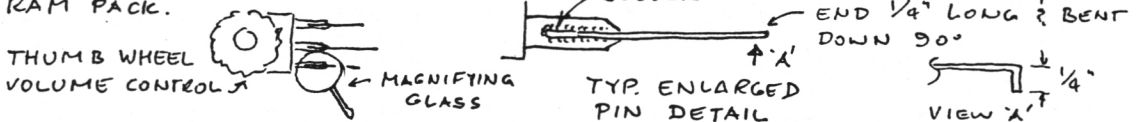
ALSO, THIS IS A GOOD TIME TO DECIDE WHETHER YOU WISH TO INSTALL THE OPTIONAL AUDIO AMP BYPASS FOR EXTERNAL AUDIO AMP CONNECTION AND OPERATION - PLEASE REFER TO THE SCHEMATIC.

WARNING: THE WIRE WRAP PIN EDGE CONNECTOR IS INSERTED INTO THE BOARD FROM THE SOLDER SIDE! BE CAREFUL TO AVOID SOLDER BRIDGES BETWEEN THE PINS - YOU CAN'T GET "IN THERE" TO FIX THEM!



SOLDER THE MALE CONNECTOR BETWEEN THE PINS, HAVING OBSERVED THE CORRECT KEY SLOT POSITION. ONE WAY OF DOING IT IS TO ALIGN THE MALE CONNECTOR WITH AND THEN SOLDER IT TO THE OUTER PINS ON BOTH ENDS FIRST, AND THEN ALL THE OTHERS.

MOUNTING THE THUMB WHEEL VOLUME CONTROL AS SHOWN ON THE COMPONENT LAYOUT HAS THE ADVANTAGE OF BEING ABLE TO TURN IT EASILY WITH ONE'S FINGERS WHILST TRYING TO AVOID "WABBLING" THE RAM PACK.

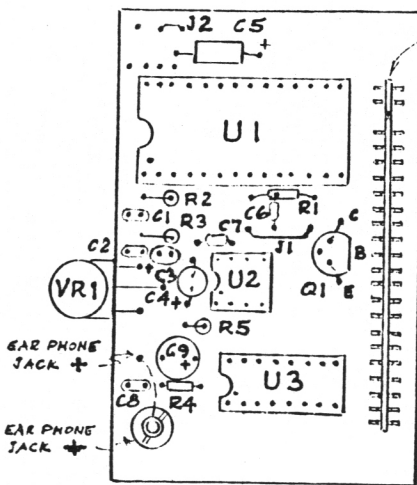


ATTACH BARE 22 GA WIRE (SOLID) LEADS TO VOLUME CONTROL AS SHOWN. REFER TO COMPONENT LAYOUT FOR INSTALLATION DETAIL. AFTER SOLDERING COMPONENTS INTO PLACE, CUT ALL PROTUDING LEADS AS FLUSH AS YOUR IC SOCKET PINS (OR IC PINS IF YOU SKIPPED THE SOCKETS). CHECK EVERYTHING VERY CAREFULLY: WATCH FOR SOLDER BRIDGES AND "OPENS" IN THE TRACES. - O.K.? PLUG IT INTO YOUR MACHINE AND WATCH FOR THE [X] CURSOR TO APPEAR. IF IT DOES NOT WITHIN THE USUAL TIME, "SHUT HER DOWN" AND TROUBLE-SHOOT THE BOARD.

INSTALL YOUR SOFTWARE AS PER THE OCT. '86 ARTICLE AND

HAPPY ZX VOICING TO YOU!

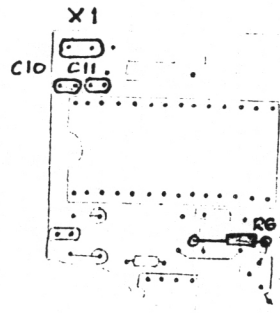
MAR '87, GERD BREUNING



COMPONENT LAYOUT
FOR TS/ZX 81

MALE
CONNECTOR

(FEMALE
CONNECTOR
ON SOLDER
SIDE)

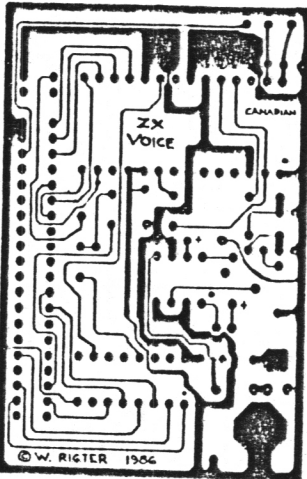


ADDITIONAL COMPONENTS
FOR 2068

NOTES ON INSTALLATION OF RG

THERE ARE NO SOLDER PADS PROVIDED ON THE PRINTED CIRCUIT BOARD FOR RG. CHOOSE ONE OF THE FOLLOWING THREE INSTALLATION INSTRUCTIONS:

- EITHER (A) DRILL HOLES MARKED \odot . INSTALL RG FIRST, THEN C 6 AND LAST R1.
- OR (B) JUST SOLDER RG TO LEG C OF Q1 AND LEG OF C6 NEAR J1.
- OR (C) INSTALL RG ON THE SOLDER SIDE ON PADS OF Q1 AND C6



SOLDER SIDE

BILL OF MATERIAL

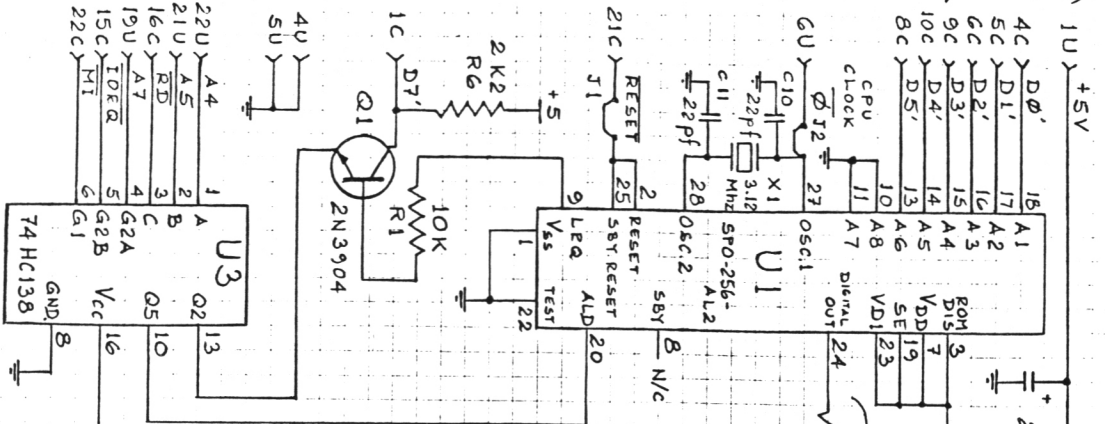
C1, C2	CAPACITOR, CERAMIC .022 μ F (2.5) # 272-1066	\$.99 1/2
C3	" , ELECTROLYTIC 10 μ F 6V (RAE)	\$.11
C4	" , TANTALUM 10 μ F 6V (RAD)	\$.97
C5	" , ELECTROLYTIC 220 μ F 6V (RAE)	\$.25
C6, C7, C8	" , CERAMIC 0.1 μ F (ACTIVE)	\$ 1.65/G
C9	" , ELECTROLYTIC 100 μ F 6V (RAE)	\$.12
C10, C11	" , CERAMIC 22 pF - 2068 ONLY (ACTIVE)	\$ 1.65/5
J1	JUMPER 22 GA SOLID, INSULATED, TYP.	
J2	" - TS/ZX 81 ONLY	
Q1	TRANSISTOR 2N3904 (RAE)	\$.76
R1	RESISTOR, CARB. FILM, 1/4W 10K Ω	
R2, R3	" " " " 33K Ω	
R4	" " " " 10 Ω	
R5	" " " " 680 Ω	
RG	" " " " 2.2K Ω - 2068 only	
U1	SPEECH SYNTHESIZER SPO-256-AL2 (Active)	\$ 12.49
U2	AUDIO AMPLIFIER - (RADIO SHACK # 276-1731)	\$ 2.19
U3	10FB DECODER 74HC138 - (ACTIVE # 16170)	\$ 1.09
VR1	VARIABLE RESISTOR, THUMB WHEEL, (RAE # PT15NB-10K)	\$.76
X1	CRYSTAL 3.12 MHZ OR 3.2768 MHZ OR 3.579545 MHZ	
	- 2068 ONLY -	Active \$ 2.69 OR Active \$ 1.59

RAE
BULK
\$.15 each

This printed circuit board layout is reproduced here so you can more easily check your work for solder bridges. It must not be used for re-production. Club members can purchase boards for \$10.00 each from the club, already drilled and ready to populate. Non-members please contact club for referral to Mr. W. Rigter.

MALE CONNECTOR - AVAILABLE FROM CLUB FOR \$ 2.00 EACH
FEMALE CONNECTOR - (RAE # ESC-50-DRMH) \$ 6.59
50 position, .1" centres, wire wrap edge connector - cut to make 2 FEMALE CONNECTORS @ 23 positions each - save one for your next project.
I.C. SOCKETS ARE OPTIONAL AND RECOMMENDED

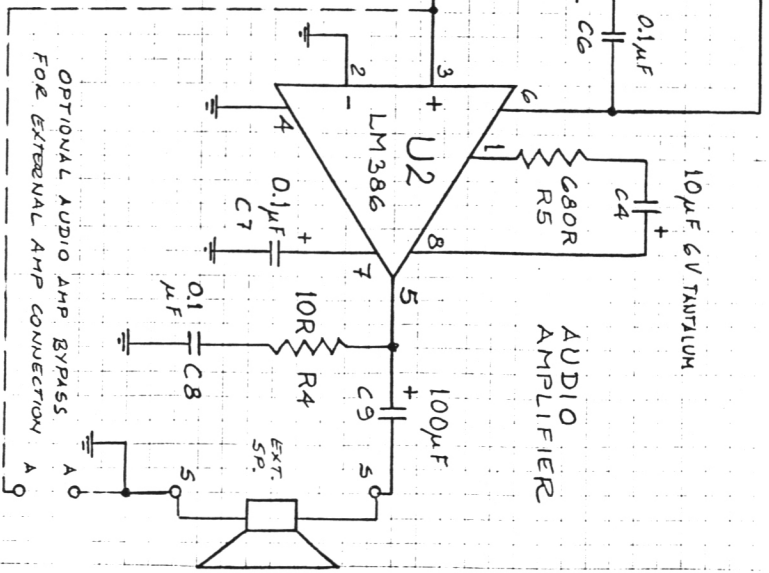
REAR CONNECTOR ON COMPUTER (U = Underside, C = Component Side)



SPEECH PROCESSOR

NOTE:

- J2 for TS/ZX81 ONLY
- C10, C11, X1, R6 for 2068 ONLY
- THERE ARE NO PADS FOR R6 (2068 ONLY) ON YOUR PCB - SEE COMPONENT LAYOUT FOR LOCATION AND ASSEMBLY NOTES.



ALL RESISTORS ARE 1/4 W 5%

ZX VOICE SCHEMATIC

© 1986 W. RICHTER

NOTES FOR EXPERIMENTERS:

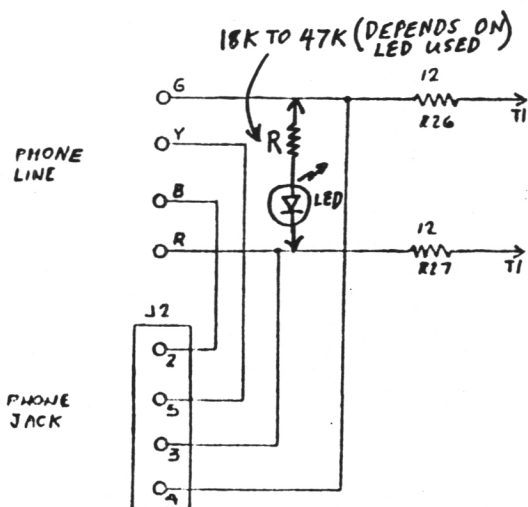
HARRY SLOT PRODUCED HIS OWN BOARD AND HOOTED UP AN EXTERNAL AMPLIFIER. THE FOLLOWING COMPONENT VALUES PRODUCED EXCELLENT RESULTS FOR HIM: R3 - 15K, C1, C2 - .02μF ±1%, C7 - 47μF, R4 and C8 - deleted, C9 - 330μF, R5 - 620Ω. FOR BEGINNERS! IT IS RECOMMENDED TO LEAVE THE FILTER AS SHOWN. R5 SETS UP THE GAIN (ON THE 1K2) PLAY WITH C7 AND C9 FOR "BEST" TONE.

SIMPLE MODEM UPGRADE

By Ken Abramson

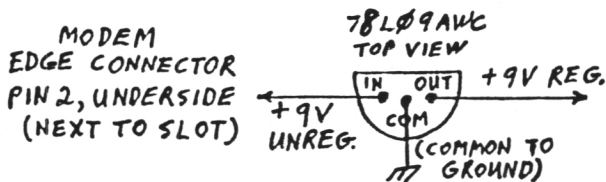
Here are two simple 2050 modem modifications you might wish to consider if you know which end of a soldering iron to hold.

The first circuit is a simple LED (light emitting diode) "LINE FREE" indicator which lights up when nobody is using the telephone line. If the line is in use, the LED will remain dark and you must wait until the "LINE FREE" light comes on before you do your auto-dialing. This handy little LED eliminates interrupting somebody's telephone conversation to find out whether they are finished talking or not. It also allows you to watch the dialing process (the LED pulses on and off).



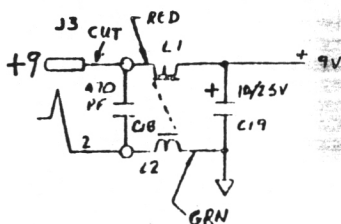
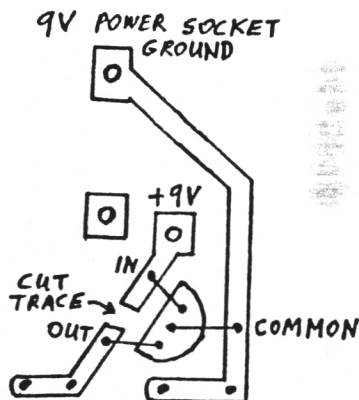
If the LED does not light up, just reverse its leads.

The second circuit is a simple voltage regulator that isolates the computer 9V supply from any stray modem signals that may find their way back into the 9V RAM supply circuit. It also regulates the 9V supply to the LM1458 modem amplifier chip, thus giving increased stability to its output levels.



This means that you can RELIABLY use the computer 9V power supply and get rid of that extra 9V modem power pack. Just use a stiff wire to fish an extra wire under the shielded covering of the modem ribbon cable, and connect this new wire to the +9V contact on the modem edge connector (see T51000 user manual P. 124 or ZX81 manual P. 167 for pinout diagram of edge connector). You can even desolder the modem 9V power supply jack and use it for other projects, if you wish.

Your new 9V line should connect to the POSITIVE trace connection of the 9V power jack.



The 78L09AUC mounts on the component side of the modem board through three holes drilled through the traces shown. First, cut the trace that goes from the +9V connection to L1 and C18 (modem schematic diagram). Scrape the remaining trace stubs well before soldering, because they have been coated with an insulating coating. If you don't have the #66 bit, you needn't drill the holes. Just mount the 78L09AUC directly on the trace side of the board (allowing for cabinet clearance) and solder it directly to the surface of the traces.

MEMBER PROFILE.

By Rusty Townsend.

On a personal note, I'm married and live in Richmond, both quite happily now for many years. My other spare-time interests include photography, star-gazing, and travel, all of which go together quite well.

From formal and other education, I hold the classification of Applied Science Technologist (Civil). Except for one 12-year stint with a major civil engineering company, I've spent most of my working years in the construction industry, and am currently employed here in Richmond by Progressive Construction Ltd. as a project manager.

By comparison, most of my electrical and electronic experience has been gained from trying to keep our Christmas tree lights working, and that was before I found out that you could buy light strings that all didn't go out just because one bulb had burnt out.

I bought my first computer, a TS1000, in 1982 with the thought that it would be a learning experience towards my eventual purchase of a bigger and better machine. With the addition of a 16K Memopac and Memocalc, I was soon and still am amazed with the capabilities of that so-called "disposable computer". I did join the TS User's Group for a short while, but dropped out because most of the other members were more technically oriented than I, and tended to speak a language I didn't understand.

In 1984, my work-load shifted almost exclusively into estimating, budgetting, and cost control and analysis. Progressive was not computerized at that time, but from my experience with my TS1000 set-up I recognized the benefits that would come from a better key-board, a more extensive spread-sheet, and a big printer. So I sold my TS1000 and other hardware, and sprung for an AppleII+ (compatible of course), monitor, double disk drives, Magicalc, and a Roland 1111 printer, all of which made my work much easier.

By 1986 my work-load had shifted away from paper-work and back into project management, and Progressive had computerized much of their accounting procedures (IBM-oriented naturally). So, even though my Apple system was not getting as much use, I was considering switching to an IBM system, and when a good opportunity came up I sold the entire Apple system retaining only the Roland printer.

While I was still trying to decide which IBM compatible to buy, I picked up an unused and virtually-new TS1500 at a local flea market. This was soon hooked up to my small TV and cassette player, and I was enjoying the use of the programs that I had written and SAVED back in 1982/83.

Maybe it was fate, but a few weeks later I picked up an even newer-looking TS2068 at that same flea market!

With this prize acquisition and with my interest in an IBM system now waning, I "walked my fingers through the yellow pages" looking for a source of software and other support for both computers without any success. Then I remembered and dug out a TS Users Group membership list from 1983. After several phone calls, being referred from one person to another, I was soon talking to Rod Humphrys who invited me to come to the club meeting on the following evening. (Fate again, eh?)

I soon found there was still much interest and support for all the TS machines. At that point my interest in an IBM system pretty well died, and the next day I bought a Zenith monitor so I could have both computers running at the same time.

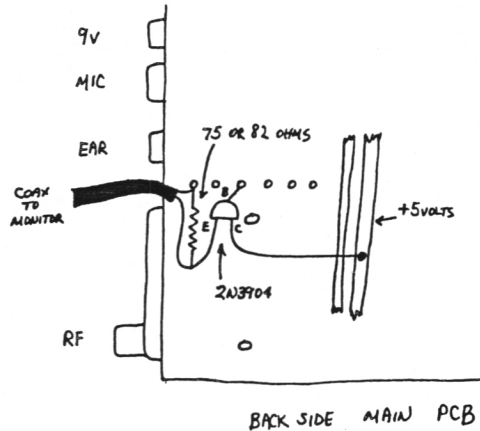
Since then I have acquired numerous supplier's catalogs, a Spectrum emulator, an OS-64 cartridge, several programs on tape or cartridge, some other instructional books, and obviously a TS2040 printer. I have put off ordering some other goodies, such as a Centronics interface to connect this TS2068 to my idle Roland printer, as I am one of those who have a QL kit on order, and want to get it assembled and running, and then maybe hook it up instead to the Roland printer.

I'll give you an up-date when all of that has happened.

Joe J.'s piece will be in the next Issue due to space limitations.

ZX81 DIRECT VIDEO OUTPUT
by Tim Stoddard

Perhaps one of the best additions to your TS/ZX is the direct monitor output. I've seen many appear from very complex to very simple. This one is very simple, but very, very effective. One transistor (2N3904) and resistor (75 ohms) buffers the composite video signal going to the RF converter. You can substitute a more common 82 ohm resistor and any good switching transistor for the ones I used. The diagram below shows the connections required to the back of the PCB. A short piece of coax cable with the proper connector (usually an RCA connector) takes the signal out to the monitor. This modification has NO AFFECT on either the normal RF output or the TAPE output.



BACK SIDE MAIN PCB

MORE VALUE FOR YOUR BYTES

BY U. LEE

CAN THE ZX BASIC PERFORM
MAGIC? THIS WELL KNOWN TRICK IS
USED TO TURN THESE THREE LINES...

```
10 IF C=1 THEN GOTO 100
20 IF C=2 THEN GOTO 200
30 IF C=3 THEN GOTO 300
```

...INTO ONE LINE.

```
10 GOTO C*100
```

BUT WHAT IF WE HAD THIS
SITUATION;

```
10 IF C=1 THEN GOTO 200
20 IF C=2 THEN GOTO 600
30 IF C=3 THEN GOTO 100
```

IT'S STILL POSSIBLE TO
SQUEEZE EVERYTHING INTO ONE LINE
BY USING THE VAL FUNCTION.

```
10 GOTO VAL "200600100" (C*3
-2 TO C*3)
```

ALONG WITH THE "IO" COMMAND
IT REPLACES THE READ, DATA,
RESTORE COMMAND FOUND IN OTHER
COMPUTER BASICS.

```
80 LET A= VAL "091425" (C*2-1 TO
C*2)
```

SWITCH IT AROUND,

```
10 FOR C= 1 TO 3
20 PRINT VAL "198019821987"
(C*4-3 TO C*4)
30 NEXT C
```

OR PUT IT INSIDE A PRINT
STATEMENT.

```
120 PRINT AT VAL "120812"(C*2-1
TO C*2),VAL "121518" (C*2-1
TO C*2);"
```

HELP!.....HELP!

I'm looking for a better
spread-sheet than either
OMNICALC 2 or VU-CALC to use on
my TS2068.

In particular, I'd like
variable column widths to 10
characters or more, or at least
columns fixed at 10 characters
wide, so it would handle
negative numbers to 8
significant digits with some
separation between columns.

Of next importance would
be the ability to display 64 or
more characters per line on a
monitor screen, either on its
own or by compatibility with an
OS-64 cartridge.

I like the freedom in
VU-CALC to control the depth of
column titles and the length of
row titles, but on a large
spread-sheet OMNICALC's titles
that scroll with the
spread-sheet are certainly
helpful even if they must be
too short to be very
descriptive.

The grid size should be at
least 50 by 50 as with VU-CALC,
or a specifiable section of a
larger one as with OMNICALC's
99 by 250 grid in order to cut
down on calculating time.

If you know of some
spread-sheet that comes close
to the above description,
please give me a call.

RUSTY TOWNSEND.....277-0156

IN ESSENCE, WE CAN MOVE VOICE AND DATA ACROSS TOWN OR ACROSS OCEANS. WE'VE GOT A TOTALLY SOFTWARE DRIVEN DIGITAL TRANSMISSION MULTIPLEXOR WITH ADAPTIVE DATA PULSE CODE MODULATION VOICE CARDS.

AND BY INTEGRATING OUR NETWORK MANAGEMENT AND DIAGNOSTIC CONTROL CAPABILITIES YOU CAN TIE YOUR LAN INTO A HIGHER LEVEL SYSTEM WORLDWIDE AND STILL CONTROL IT FROM A CENTRAL POINT.



WELL THAT ALL SOUNDS VERY GOOD MR. RATH, AND I'LL THINK ABOUT IT. NOW, COULD YOU TRANSFER ME TO YOUR MARKETING DEPARTMENT?

HO BOY, THAT'S A TOUGH ONE. I'LL PROBABLY LOSE YOU, BUT, HERE GOES.



V S U G

THE VANCOUVER SINCLAIR USERS GROUP HAS BEEN IN EXISTENCE SINCE 1982. WE ARE A SUPPORT GROUP FOR THE OWNERS AND USERS OF THE: MICROACE, ZX80, ZX81, TS 1000, TS 1500, SPECTRUM, SPECTRUM +, TS 2068, AND QL COMPUTERS.

PRES.--KEN ABRAMSON
 V/PRES.-- ?
 TREAS. & EDITOR--ROD HUMPHREYS

OUR MEMBERSHIP DUES ARE ONLY \$15.00/YEAR AND MAY BE SENT TO THE TREASURER.

ROD HUMPHREYS
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